

Appl. No. 09/619,520  
Amdt. dated May 27, 2004  
Reply to Office Action of February 27, 2004

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

- 1                   1.       (Currently Amended) An apparatus for pumping and sterilizing or  
2       disinfecting fluids liquid held in a reservoir, comprising:  
3                   a fluid conduit, which is at least partially submerged in the liquid held in the  
4       reservoir;  
5                   a ultraviolet light source which is at least partially within the fluid conduit, the  
6       ultraviolet light source comprising a protective sleeve surrounding at least a portion of the  
7       ultraviolet light source and protecting the ultraviolet light source from breaking; and  
8                   an air drive unit coupled to the fluid conduit and adapted to cause a liquid to flow  
9       through the fluid conduit and past the at least a portion of the ultraviolet light source, wherein  
10       said ultraviolet light source generates an ultraviolet light which kills microorganisms in the  
11       liquid and said fluid conduit.
- 1                   2.       (Previously Presented) The apparatus as recited in claim 1, wherein said  
2       ultraviolet light source comprises a casing for holding a gas and a vaporizable material, and at  
3       least one electrode electrically coupled to a power source for exciting said gas and said  
4       vaporizable material.
- 1                   3.       (Original) The apparatus as recited in claim 2, wherein said protective  
2       sleeve comprises a UV transmissive material.
- 1                   4.       (Original) The apparatus as recited in claim 3, wherein said protective  
2       sleeve is a fluoropolymer sleeve.
- 1                   5.       (Original) The apparatus as recited in claim 2, wherein said casing  
2       comprises a fluoropolymer casing.

Appl. No. 09/619,520  
Amdt. dated May 27, 2004  
Reply to Office Action of February 27, 2004

PATENT

6. (Previously Presented) The apparatus as recited in claim 2 4, wherein said casing comprises a quartz or glass casing and said fluoropolymer sleeve surrounds said quartz or glass casing.

7. (Original) The apparatus as recited in claim 3, wherein said protective sleeve comprises a silicon polymer or silicone material.

8. (Original) The apparatus as recited in claim 4, wherein said fluoropolymer sleeve is made from a fluoropolymer selected from the group of fluoropolymers including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

9. (Cancelled)

10. (Original) The apparatus as recited in claim 2, wherein said protective sleeve comprises a removable container.

11. (Previously Presented) The apparatus as recited in claim 2, wherein said protective sleeve hermetically seals said ultraviolet light source.

12. (Cancelled)

13. (Previously Presented) The apparatus as recited in claim 6, wherein said fluoropolymer sleeve is heat shrunk around said quartz or glass casing of said ultraviolet light source.

14. (Previously Presented) The apparatus as recited in claim 6, wherein said fluoropolymer sleeve is form pressed around said quartz casing of said ultraviolet light source.

15. (Previously Presented) The apparatus as recited in claim 6, wherein said fluoropolymer sleeve is formed around said quartz or glass casing of said ultraviolet light source by dipping said ultraviolet light source into a liquid material.

Appl. No. 09/619,520

Amdt. dated May 27, 2004

Reply to Office Action of February 27, 2004

**PATENT**

1                   16. (Previously Presented) The apparatus as recited in claim 1, further  
2 comprising a power source, wherein said power source is a solar power source connected to said  
3 ultraviolet light source, and wherein said protective sleeve surrounds said solar power source and  
4 said ultraviolet light source and hermetically seals said solar power source with said ultraviolet  
5 light source.

1                   17. (Previously Presented) The apparatus as recited in claim 1, wherein said  
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated  
3 body portion formed between said first end portion and said second end portion, and wherein  
4 said protective sleeve comprises a fluoropolymer sleeve covering at least a portion of said  
5 elongated body portion and first and second end caps covering said first and said second end  
6 portions, respectively, and forming a seal with the fluoropolymer sleeve.

1                   18. (Original) The apparatus as recited in claim 17, wherein said first and said  
2 second end caps comprise fluoropolymer end caps.

1                   19. (Original) The apparatus as recited in claim 17, wherein said first and said  
2 second end caps comprise silicone end caps.

1                   20. (Original) The apparatus as recited in claim 17, wherein said first and said  
2 second end caps are sealed to said protective sleeve using a silicone sealer.

1                   21. (Cancelled)

1                   22. (Currently Amended) A method of pumping and sterilizing or disinfecting  
2 a fluid liquid held in a reservoir, comprising the steps of:

3                   positioning a fluid conduit at least partially submerged in the liquid held in the  
4 reservoir,

5                   placing an ultraviolet light source at least partially within a the fluid conduit, the  
6 ultraviolet light source comprising a protective sleeve surrounding at least a portion of the  
7 ultraviolet light source and preventing the ultraviolet light source from breaking;

Appl. No. 09/619,520  
Amdt. dated May 27, 2004  
Reply to Office Action of February 27, 2004

PATENT

8 pumping air into the fluid conduit to pump liquid through the fluid conduit and  
9 past at least a portion of the ultraviolet light source; and  
10 illuminating said ultraviolet light source so that an ultraviolet light is generated,  
11 killing microorganisms in the liquid and said fluid conduit.

1 23. (Original) The method as recited in claim 22, wherein said ultraviolet  
2 light source comprises a casing for holding a gas and a vaporizable material, and at least one  
3 electrode electrically coupled to said power source for exciting said gas and said vaporizable  
4 material.

1 24. (Original) The method as recited in claim 23, wherein said protective  
2 sleeve is a fluoropolymer sleeve.

1 25. (Original) The method as recited in claim 23, wherein said casing  
2 comprises a fluoropolymer casing.

1 26. (Previously Presented) The method as recited in claim 24, wherein said  
2 casing comprises a quartz or glass casing and said fluoropolymer sleeve surrounds said quartz or  
3 glass casing.

1 27. (Previously Presented) The method as recited in claim 24, wherein said  
2 fluoropolymer sleeve is made from a fluoropolymer selected from the group of fluoropolymers  
3 including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 28. (Original) The method as recited in claim 23, wherein said protective  
2 sleeve comprises a silicon polymer or silicone material.

1 29. (Cancelled)

1 30. (Original) The method as recited in claim 22, wherein a protective sleeve  
2 comprises a removable container.

Appl. No. 09/619,520

Amdt. dated May 27, 2004

Reply to Office Action of February 27, 2004

PATENT

1                   31. (Previously Presented) The method as recited in claim 22, wherein a  
2 protective sleeve hermetically seals said ultraviolet light source.

1                   32. (Cancelled)

1                   33. (Previously Presented) The method as recited in claim 26, wherein the  
2 fluoropolymer sleeve is heat shrunk around said quartz or glass casing of said ultraviolet light  
3 source.

1                   34. (Previously Presented) The method as recited in claim 26, wherein the  
2 fluoropolymer sleeve is form pressed around said quartz or glass casing of said ultraviolet light  
3 source.

1                   35. (Previously Presented) The method as recited in claim 24, wherein said  
2 fluoropolymer sleeve is formed around said quartz or glass casing of said ultraviolet light source  
3 by dipping said ultraviolet light source into a fluoropolymer liquid material.

1                   36. (Previously Presented) The method as recited in claim 22, wherein said  
2 power source is a solar power source connected to an ultraviolet light source, and wherein a  
3 protective sleeve surrounds said solar power source and said ultraviolet light source and  
4 hermetically seals said solar power source with said ultraviolet light source.

1                   37. (Previously Presented) The method as recited in claim 22, wherein a  
2 ultraviolet light source comprises a first end portion, a second end portion, and an elongated  
3 body portion formed between said first end portion and said second end portion, and wherein  
4 said protective sleeve comprises a fluoropolymer sleeve covering at least a portion of said  
5 elongated body portion and first and second end caps covering said first and said second end  
6 portions, respectively, and forming a seal with the fluoropolymer sleeve.

1                   38. (Original) The method as recited in claim 37, wherein said first and said  
2 second end caps comprise fluoropolymer end caps.

Appl. No. 09/619,520

PATENT

Amtd. dated May 27, 2004

Reply to Office Action of February 27, 2004

1                   39. (Original) The method as recited in claim 37, wherein said first and said  
2 second end caps comprise silicone end caps.

1                   40. (Original) The method as recited in claim 37, wherein said first and said  
2 second end caps are sealed to said protective sleeve using a silicone sealer.

1                   41. (Cancelled)

1                   42. (Cancelled)